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ABSTRACT

This report supplements a 1966 report measuring trends in the production of geography graduates (see related document SO 008 431). The statistical information in this report was collected from published sources and a questionnaire sent to geography department chairmen in 1971. The results of the questionnaire indicate a surplus of Ph.D. graduates in geography for the number of jobs available in the field. The number of degrees in geography at the doctoral, master's, and baccalaureate levels is expected to double in the 1970s. College teaching remains the preemptive career choice of geographers, yet the surplus will encourage university administrators to hold down salaries, increase teaching loads, and defer tenure. Geographers formerly dependent upon college teaching jobs must develop alternative career opportunities. The ten largest geography departments granted over 50 percent of all doctoral degrees. The center of graduate activity is shifting to universities on the west coast. Urban geography, cultural geography, and economic geography are the most popular topical specialities of contemporary graduate students. (Author/DE)

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An Updated Report

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MANPOWER IN GEOGRAPHY

An Updated Report

JOHN FRASER HART
University of Minnesota
Minneapolis, Minnesota 55455

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FOREWORD

I must begin with an apology: this report should have been prepared at least a year ago, but the time I needed for it was preempted by other activities, and I am distressed and apologetic that they have so long delayed its appearance. It would not have been completed even now without the help and encouragement of many people, and I am deeply grateful to all of them: to John Lounsbury, Director of the Commission on College Geography, who encouraged me to prepare it and waited patiently while I did so; to Steve Pontius, who devoted an enormous amount of time to tabulating the graduate student questionnaires; to Dick Skaggs, who came to my rescue every time the computer started doing strange things, and was always ready to react to my ideas and to pour cold water on the really weird ones; to Pat Burwell, who drew the maps and graphs with her customary celerity and flair; to Arlette Lindbergh,who typed the text faster than I had any right to expect it; to Jackie Schroeder, who typed most of the tables; to Doug Caruso, who mailed the questionnaires; and to pirate Freeman's felicitous phrase, "wives of some authors are hot candidates for a stained glass window."

The report would have been impossible, of course, without the cooperation of chairmen, graduate students, and those much maligned and grossly overworked ladies, the departmental secretaries, who completed and returned the questionnaires; I am especially apologetic to them for my unconscionable delay in producing the results.

JOHN FRASER HART

Minneapolis, Minnesota
23 September 1972

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HIGHLIGHTS

1. Production of degrees in geography, at all three levels, began to skyrocket in the early 1960s when the postwar baby boom hit the universities.

2. In the five years between 1 July 1965 and 30 June 1970 a total of 39 geography departments granted 502 doctorates, 125 departments granted 2,582 masters degrees, and 304 departments granted 13,806 baccalaureate degrees.

3. The number of degrees in geography at all three levels is expected to double during the 1970s.

4. The carryover of a manpower deficit from the 1960s eased the impact of the Ph.D. surplus in geography, and its full force will first be felt in the fall of 1973.

5. If college teaching remains the preemptive career choice of geographers, the surplus number of geography Ph.D.'s expected to be granted in 1980 will nearly equal the total number granted in 1968.

6. The Ph.D. surplus will encourage attempts by university administrators to hold down salaries, increase teaching loads, and defer tenure.

7. Geographers became too dependent upon college teaching jobs in the 1960s, and must begin to develop alternative career opportunities, with a positive attitude toward them, for new Ph.D.'s.

8. Quotas on degrees are undesirable, but smaller graduate departments should think about devoting all of their resources to undergraduate instruction and faculty research.

9. The ten largest geography departments at each level granted 52.5 percent of the doctorates, 23.7 percent of the masters degrees, and 17.2 percent of the baccalaureates.

10. The center of gravity of geography in the United States seems to be shifting from the Middle West toward the West Coast.

11. Large graduate and undergraduate programs can be offered in the same geography department; they are not mutually exclusive.

12. Masters degree programs in geography have been increasing at a more rapid rate than doctoral or baccalaureate programs.

13. The median age of geography Ph.D.'s in 1970 was 45 years; the median age at which they had received their doctorates was 33 years.

14. Thirty percent of the doctorates listed in the 1970 AAG *Directory* had been conferred within the preceding five years, and nearly ninety percent had been conferred since the end of World War II.

15. Academic careers are the overwhelming choice of doctoral candidates in geography, and they disdain other forms of employment which many of them will be forced to accept.

16. Urban geography, cultural geography, and economic geography are the most popular topical specialties of contemporary graduate students in geography.

17. Eleven percent of the contemporary doctoral candidates in geography claimed no interest in any region, and three-fifths had no major interest in any region outside the United States and Canada.

18. The largest numbers of new staff appointments in the early 1970s were in the urban/economic/quantitative "interest cluster," followed by physical geography, cultural/historical geography, cartography/remote sensing, and regional geography.

19. Only the highest degree it offers seems to be taken very seriously by a department.

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20. Two-fifths of undergraduate geography majors expect to become school teachers, a quarter plan graduate work, a sixth desire employment in government agencies, and a tenth hope to work in private industry.

21. Between 1965 and 1970 only 4.2 percent of the doctorates in geography, 16.2 percent of the masters degrees, and 21.3 percent of the baccalaureate degrees were granted to women.

22. Higher educational institutions in California have done a better job of recruiting women into geography than those in other parts of the United States.

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INTRODUCTION

Six years ago a report on geographic manpower was concerned about the shortage of people to fill available jobs.[1] This one was prepared on the eve of what threatens to be a job shortage as bad as the hungry days of the 1950s, perhaps even worse. The rapidity of change in the geographic job market might offer a faint ray of hope that some of the direst predictions in the present report will be proven incorrect, although it is only fair to say that the short-range forecasts in the previous report were surprisingly accurate.

This report, like the previous one, is concerned primarily with new entrants into the profession, and it is largely quantitative. It is possible, for example, to arrive at a fairly accurate estimate of the number of geographers who have received certain academic degrees, or the number who profess interest in some branch of the subject, but the attainment of a degree or an expression of interest no more demonstrates competence than the lack of a degree, or of an expression of interest, demonstrates that competence is lacking. A head count of geographers can be useful, but qualitative evaluations still remain necessary.

One of the most desirable yet difficult qualitative evaluations in contemporary geography would be a survey of the limited number of geographers who have achieved a record of sustained professional activity. These are the men who have published, and continue to publish. These are the men who have demonstrated their readiness for the big jobs by doing the small jobs well. These are the men who willingly accept responsibility, who see that a job needs to be done and do it, without waiting to be asked or told. These are the men who can be counted on to deliver the goods, the men who are called on far too often for far too many chores because far too few other geographers have striven to emulate the example they have set.

SOURCES OF INFORMATION

The statistical information in this report was collected both from published sources and from the return to questionnaires circulated in the spring of 1971. Two questionnaire forms were used. A departmental questionnaire asked each chairman to indicate the career plans of students who would receive their baccalaureate degrees in 1971, the teaching specialties of new staff appointments made in 1971 and anticipated for 1972, and the surplus of Ph.D.'s (Appendix A). The graduate student questionnaire requested each graduate student in residence to indicate the highest degree to which he aspired, the year in which he expected to receive it, his choice of career, and his areas of professional specialization (Appendix B).

The departmental questionnaire was sent to the chairmen of 259 departments which listed undergraduate majors in the April 1970 edition of the *Directory of College Geography*.[2] Replies were received from 130 departments (50 percent), of which 26 were in two-year institutions. In addition, the departmental questionnaire was sent to the chairmen of all 127 departments listed in the *Guide to Graduate*

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[1] John Fraser Hart, *Geographic Manpower: A Report on Manpower in American Geography*, Commission on College Geography Publication No. 3 (Washington: Association of American Geographers, 1966).

[2] J.R. Schwendeman, Sr., and J.R. Schwendeman, Jr., eds., *Directory of College Geography of the United States: Academic Year 1970-1971*, Vol. 22 (Richmond, Ky.: Geographical Studies and Research Center at Eastern Kentucky University, 1971).

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Departments of Geography, 1970-71.[3] These chairmen were also requested to have each graduate student in residence complete and return a copy of the graduate student questionnaire. Responses were received from 26 of the 51 (51 percent) departments in the United States which offer the doctorate, 30 of the 58 (52 percent) which offer a terminal masters degree, and 16 of the 18 (89 percent) graduate departments in Canada.

A response rate of only fifty percent in the United States was disappointing, not because it is inadequate, but because of what it reveals about the department chairmen. Admittedly it is fashionable in certain quarters to scorn questionnaires, but it does seem rather arrogant to refuse to respond to one which deals with a subject of such serious concern to many geographers at the present moment. The chairmen who failed to complete and return the questionnaire deserve castigation almost as much as the author who has so long delayed the processing and publication of the results of the survey.

In addition to the information obtained from the questionnaires, data on the number of degrees granted by individual geography departments was extracted from three published sources: the *Guide to Graduate Departments of Geography*, the *Directory of College Geography*, and *Earned Degrees Conferred.*[4] Geographers may be sorely tempted to use the data in the *Guide* or the *Directory*, because both publications are well known and readily available, but their data must be considered suspect at very best, and they probably are less than useless for analyzing trends; *Earned Degrees Conferred* is the best source.

A volume entitled *Earned Degrees Conferred* has been published each year since 1948-49 by the U. S. Office of Education. The annual volume is compiled from questionnaires returned by each institution of higher education in the United States. It lists the total number of degrees granted by the institution, and breaks down this total by fields of study; geography is classified as a separate field. Each volume shows the number of doctors, masters, and baccalaureate degrees granted by every geography department in the United States for the period beginning 1 July and ending 30 June of the following year. The inclusion of August degrees with those granted the following June is one of the awkward features of *Earned Degrees Conferred*, especially where advanced degrees are concerned; most of us feel that the academic year begins in September, and we think of June and August degrees as products of the same year, rather than separating them. A second awkward feature of *Earned Degrees Conferred* is its inclusion of an indeterminable number of education degrees under the geography rubric; some institutions, especially those which specialize in teacher training, report education degrees with a major in geography as degrees in geography rather than in education. A third awkward feature of *Earned Degrees Conferred* is the amount of time needed for its compilation and publication; compilation of the 1970-71 data had not been completed at the end of August 1972, and their publication was only a gleam in someone's eye.

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[3] *Guide to Graduate Departments of Geography in the United States and Canada – 1970-1971* (Washington: Association of American Geographers, 1970).

[4] *Guide to Graduate Departments*, op. cit., footnote 3; *Directory of College Geography*, op cit., footnote 2; and U. S. Department of Health, Education, and Welfare, Office of Education, National Center for Educational Statistics, *Earned Degrees Conferred: 1969-70*, DHEW Publication No. (OE) 72-2, Superintendent of Documents catalog number HE 5.254:54013-70-B (Washington: Government Printing Office, 1972). The section on manpower in Edward J. Taaffe, ed., *Geography* (Englewood Cliffs, N.J.: Prentice-Hall, 1970), pp. 106-14, was not useful.

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Despite its shortcomings, *Earned Degrees Conferred* is the most accurate indicator of degrees granted in geography in the United States. There is no overlap from one year to the next, because the data in each volume are restricted to a specific time period, 1 July to 30 June of the following year. The data for all three degree levels are comparable from year to year, they extend back nearly a quarter of a century, and they provide the base for official estimates of future trends. They are collected by the U. S. Office of Education from institutions which have considerable interest in being as cooperative with OE as possible. They are compiled at the institutional level by the administrative official who is paid to keep accurate records, one who appreciates their importance, and one who has nothing to gain by inflating or deflating the figures for individual departments.

Both the *Guide* and the *Directory* are weak in the very areas where *Earned Degrees Conferred* is strong. The successive annual editions of each one contain elements of overlap and double counting, because their time periods are not precise: the *Guide* for 1970-71, for example, shows graduate degrees granted in "1969-70," and each issue of the *Directory* lists advanced degrees granted during "the preceding calendar year." Neither attempts to include data on first degrees, although the *Directory* does make an effort to list the number of undergraduate major students in each department. Both the *Guide* and the *Directory* are based on data provided by department chairmen or their representatives, but both are incomplete, because some graduate departments elect not to advertise in the *Guide*, and some chairmen do not deign to return *Directory* questionnaires. Furthermore, it appears that some departments keep more accurate records than others, and some chairmen cannot resist the temptation to make their departments look good by doing a bit of fudging with the figures.

Some of the pitfalls in putting the data to uses for which they were never intended can be illustrated by examination of the number of doctoral degrees listed in *Earned Degrees Conferred*, the *Guide*, and the *Directory* for time periods as nearly comparable as possible (Table1). *Earned Degrees Conferred* says that 33 geography departments granted 145 Ph.D.'s between 1 July 1969 and 30 June 1970, the *Guide* says that 34 departments granted 165 degrees in 1969-70, and the *Directory* says that 27 departments granted 126 degrees in calendar 1970. The mean numbers of doctorates per department (4.85, 4.40, and 4.66, respectively) indicate that chairmen are biased toward overstatement, a quarter of a doctorate in the *Directory* and nearly half a doctorate in the *Guide*.

Some, perhaps much, of the discrepancy might be explained by the difference in the number of doctorates granted in August 1969 and August 1970, a difference which might total ten doctorates or more if we are correct in assuming that half of all doctorates are granted in August rather than in June, and that the number of doctorates granted was rising at a rate of about twenty per year. The data for 1969-70 in *Earned Degrees Conferred* clearly include only doctorates granted in August 1969, the 1970 data in the *Directory* presumably include only those granted in August 1970, and the 1969-70 data in the *Guide* conceivably could include both. Students of geographic manpower would be enormously grateful if the *Guide* could be more precise in stipulating a time period for its data, although such an improvement would be of scant value unless department chairmen could be encouraged to become more scrupulous in keeping their records and more cooperative in reporting them. The usefulness of data in the *Directory*, for example, is so vitiated by the noncooperation of ten doctoral departments and at least a dozen terminal masters departments that its data are not used hereafter in this report.

TABLE 1. DOCTORATES GRANTED IN 1969-70

Institution	E.D.C.[a]	Guide[b]	Directory[c]
University of California, Berkeley	5	10	5
University of California, Los Angeles	13	14	15
University of Colorado	1	2	–
University of Denver	1	1	1
University of Florida	3	5	4
University of Georgia	3	3	3
Northwestern University	1	3	2
University of Chicago	8	7	7
University of Illinois	4	4	2
Southern Illinois University	0	0	1
Indiana University	3	4	6
University of Iowa	4	4	5
University of Kansas	3	2	–
Louisiana State University	8	7	–
Johns Hopkins University	5	8	–
University of Maryland	0	1	–
Boston University	3	3	3
Clark University	2	2	–
Michigan State University	9	12	10
University of Michigan	6	7	–
University of Minnesota	9	7	9
University of Southern Mississippi	1	–	2
University of Nebraska	5	4	4
Columbia University	5	4	4
Syracuse University	4	4	3
University of North Carolina	1	4	–
Ohio State University	5	6	4
University of Cincinnati	1	2	1
University of Oklahoma	5	3	6
Oregon State University	0	1	1
University of Oregon	4	6	6
Pennsylvania State University	2	3	–
University of Pittsburgh	1	2	2
University of Texas	0	0	1
University of Tennessee	4	4	3
University of Washington	11	11	16
University of Wisconsin	5	5	–
Total	145	165	126

[a]Degrees granted between 1 July 1969 and 30 June 1970, as listed in *Earned Degrees Conferred*, op. cit., footnote 4.

[b]Degrees granted in 1969-70, as indicated in the *Guide to Graduate Departments of Geography*, op. cit., footnote 3.

[c]Degrees granted in calender year 1970, as indicated in the *Directory of College Geography*, op. cit., footnote 2.

Large discrepancies in the numbers of 1969-70 masters degrees reported in *Earned Degrees Conferred* and in the *Guide* show why the data in the *Guide* have also been ruled out. The total numbers are deceptively similar, but only because the differences balance each other out. *Earned Degrees Conferred* shows that 106 departments granted 637 degrees, and the *Guide* shows that 109 departments granted 632, but each lists departments which are not in the other. *Earned Degrees*

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Conferred has 13 departments and 62 degrees which are not in the *Guide*, and the *Guide* has 16 departments and 39 degrees which are not in *Earned Degrees Conferred*. The adjusted totals for the 93 departments on both lists are still fairly close, 575 degrees in *Earned Degrees Conferred* and 593 in the *Guide*, but both totals include California State College, Los Angeles, which shows 60 masters degrees in the *Guide* but only one in *Earned Degrees Conferred*.

Los Angeles State is the extreme (an obvious error), but 72 of the other 92 joint-listed departments also had different figures on the two lists. The differences have a statistically normal distribution around a mean slightly above zero, which indicates that the *Guide* is not biased toward overreporting, as one might have suspected, but the sum of the differences for the 92 departments is a hefty 164 masters degrees, and it mounts to a whopping 317 degrees if one includes all masters departments on both lists. The magnitude of the differences is so great that the two lists should not be used interchangeably, and thus the remainder of this report is restricted to *Earned Degrees Conferred* as a source of degree data.

TRENDS AND PROJECTIONS

The data in *Earned Degrees Conferred* provide the basis for estimates of the number of baccalaureate, masters, and doctors degrees which will be granted in broad subject area categories during the forthcoming decade; these estimates are published in *Projections of Educational Statistics to 1980-81*.[5] Although geography is included in a broad social sciences category, along with anthropology, economics, history, international relations, political science, public administration, and sociology, the number of degrees granted in geography over the past two decades has had an eerily close relationship with the total number of social science degrees granted at all three degree levels, baccalaureate, masters, and doctorate (Figs. 1-3).

The coefficients of correlation between the number of degrees granted in the social sciences and in geography each year for the period of 1950-51 through 1969-70 are 0.99 for baccalaureates, 0.985 for masters degrees, and 0.95 for doctorates. There is no reason to suppose that such close relationships will persist over the next decade, of course, but neither is there any reason to suppose that they will not. If we assume that they will persist, we can apply the regression equations to the estimates of social sciences degrees in *Projections of Educational Statistics* in order to estimate the number of geography degrees which will be granted each year through 1980-81. If we let Y represent the estimate of social sciences degrees which will be granted in a given year, and X represent the number of geography degrees which will be given in the same year, we can derive estimates of future geography degrees by inserting the appropriate values of Y in the following formulae:

Baccalaureate degrees:	$X = 0.025\,Y - 343$ (Fig. 1)
Masters degrees:	$X = 0.030\,Y + 37$ (Fig. 2)
Doctorates:	$X = 0.032\,Y + 12$ (Fig. 3)

After stuttering around for most of the 1950s, production of degrees in geography and the social sciences began to move into high gear around 1960, when the

[5] U.S. Department of Health, Education, and Welfare, Office of Education, National Center for Educational Statistics, *Projections of Educational Statistics to 1980-81*, DHEW Publication No. (OE) 72-99, Superintendent of Documents catalog number HE 5.210:10030-71 (Washington: Government Printing Office, 1972).

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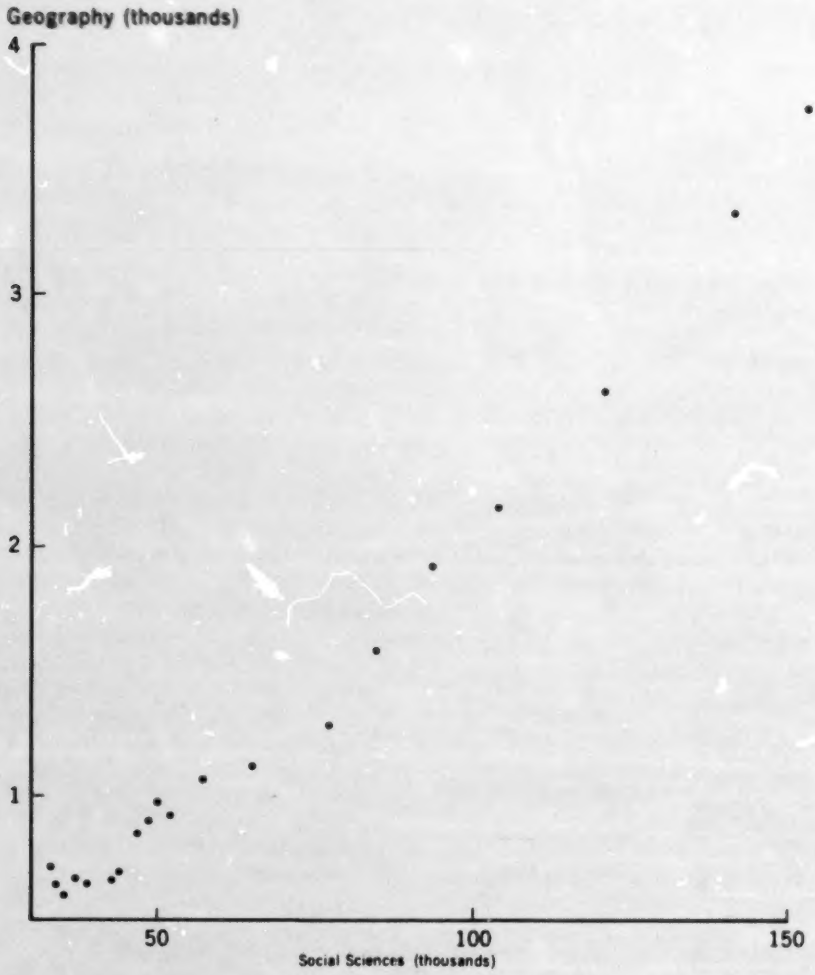

Fig. 1. Baccalaureate Degrees, 1950-51 through 1969-70

postwar baby boom hit the universities, and it has skyrocketed ever since (Table 2; Figs. 1-4). The numbers of doctorates and masters degrees in 1969-70 were almost identical with the numbers of degrees at the next lower level only fifteen years previously, 145 doctorates in 1969-70 and 141 masters degrees in 1954-55, 637 masters degrees in 1969-70 and 651 baccalaureate degrees in 1954-55; projections to 1984 are just as mind-boggling as they are improper. The number of baccalaureate degrees in geography was four times as great in 1969-70 as in 1960-61, the

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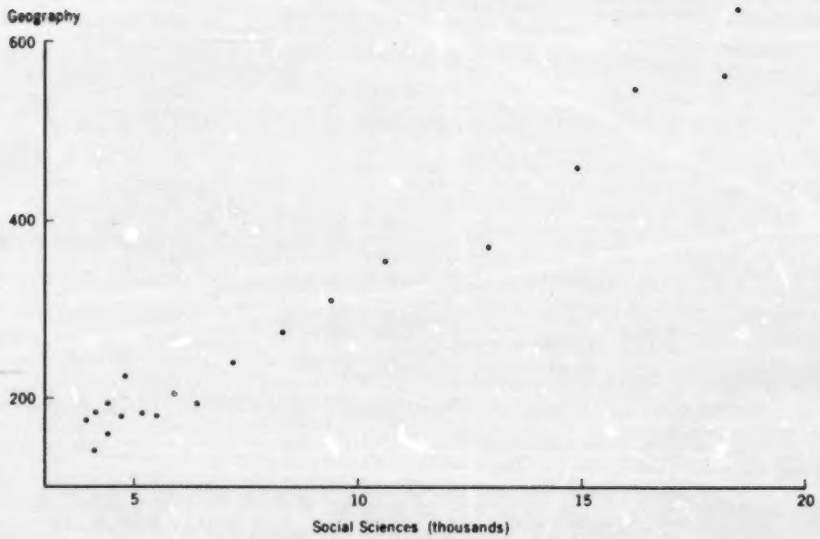

Fig. 2. Masters Degrees, 1950-51 through 1969-70

number of masters degrees was up 3.3 times, and doctorates were up 2.9 times. And the fun has just begun, if our estimates are even close to the mark; the number of geography degrees at all three levels will double in the 1970s. By 1980 people with doctorates and masters degrees will be pouring off the geographic assembly line at six times the annual rate of 1960, and nearly eight times as many people with baccalaureate degrees in geography will be turned out into the cold cruel world each year. What are all these people going to do for a living?

As an exact science, estimating total future needs for geographers is about on a par with estimating the incidence of adultery in American society, but perhaps an educated guess of the number of new doctorates needed to fill college teaching positions each year can be made by using the same procedure that was used in *Geographic Manpower.*[6] This procedure assumes that three relationships of the early 1960s will persist through the 1970s: 1) the need for new full-time college geography teachers will remain 0.0022 percent of the total degree-credit fall enrollment in all institutions of higher education; 2) twenty-three percent of all new full-time college geography teachers will have doctorates; and 3) thirty-five percent of those who receive doctorates will begin teaching for the first time (Table 3). Although this procedure results in little better than a set of educated guesses, its estimate of 198 jobs for the fall of 1972 is only slightly higher than the total of 184 which Pontius derived independently from a careful survey of jobs which were actually advertised.[7]

[6] Hart, op. cit., footnote 1, pp. 6-7.

[7] Steven K. Pontius arrived at this total by tabulating all entries in *Jobs in Geography* and all job announcements received by the Geography Department at the University of Minnesota during the academic year 1971-72.

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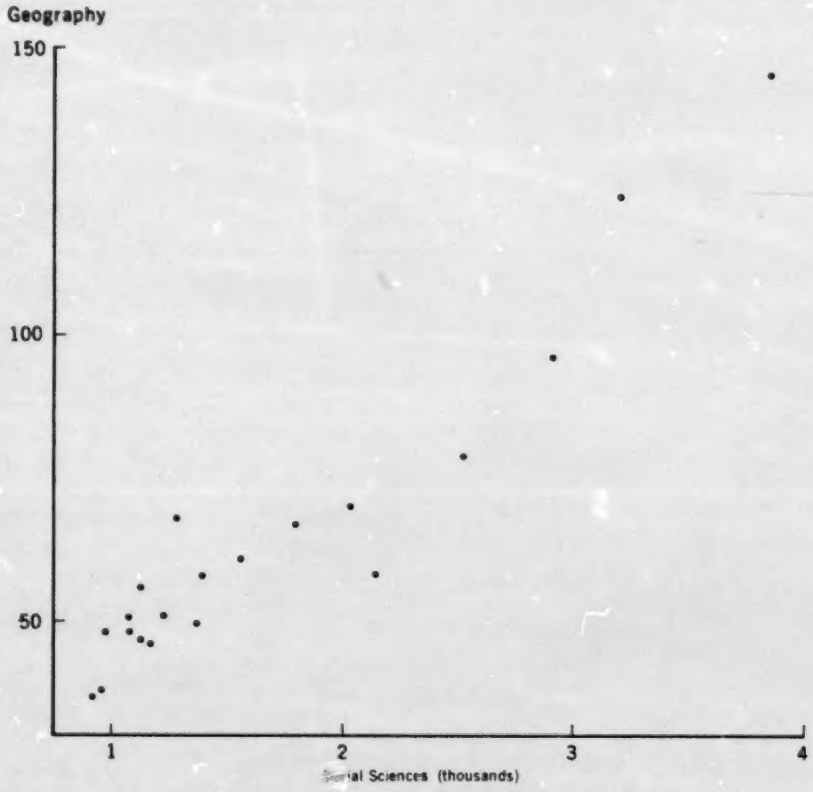

Fig. 3. Doctorates, 1950-51 through 1969-70

The results indicate that a serious shortage of Ph.D.'s in geography bottomed out in 1966, and did not end until 1969 (Table 3; Fig. 4). If all of the deficits of the 1960s are totalled and treated as a carryover that had to be erased by subsequent surpluses, however, the shortage of Ph.D.'s in geography was not actually alleviated until 1972, and the class of 1973 is going to be the first that is really going to feel the manpower crunch. The crunch is going to worsen steadily through the middle and late 1970s, and the anticipated surplus of Ph.D.'s in geography which will be granted in 1980 will nearly equal the total number granted in 1968. Such a prediction would be truly frightening if it were not based on the assumption that college teaching will remain the preemptive career choice of all those who receive Ph.D.'s in geography, but such an assumption clearly is unnecessary.

THE SURPLUS OF PH.D.'S

In recent years the popular prints have been full of scare stories about the national surplus of people with Ph.D.'s. Most of these stories, when one scrutinizes

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TABLE 2. GEOGRAPHY DEGREES AWARDED, 1950-51 to 1969-70, AND PROJECTED TO 1980-81

Year	Baccalaureate[a]	Masters[b]	Doctors[c]
1950-51	703	226	48
1951-52	669	194	37
1952-53	647	185	39
1953-54	708	177	51
1954-55	626	141	48
1955-56	651	161	46
1956-57	699	182	47
1957-58	849	184	56
1958-59	903	181	51
1959-60	973	206	68
1960-61	939	193	50
1961-62	1067	242	58
1962-63	1122	274	61
1963-64	1296	310	67
1964-65	1597	355	70
1965-66	1934	370	58
1966-67	2163	463	79
1967-68	2624	549	96
1968-69	3338	563	124
1969-70	3747	637	145
Projected			
1970-71	3807	652	139
1971-72	4120	697	149
1972-73	4493	751	157
1973-74	4761	806	164
1974-75	5140	868	182
1975-76	5527	917	197
1976-77	5915	975	202
1977-78	6322	1029	233
1978-79	6731	1061	247
1979-80	7035	1132	265
1980-81	7309	1183	284

[a]Projected by $X = 0.025 Y - 343$ where X represents degrees in geography and Y represents degrees in social science.

[b]Projected by $X = 0.030 Y + 37$ where X represents degrees in geography and Y represents degrees in social science.

[c]Projected by $X = 0.032 Y + 12$ where X represents degrees in geography and Y represents degrees in social science.

Source: Actual data from *Earned Degrees Conferred*, op. cit., footnote 4; projected data based on estimates in *Projections of Educational Statistics to 1980-81*. op. cit., footnote 5.

them carefully, turn out to be just that – stories. Each of us has heard about the academic position for which hundreds of qualified people have applied, but it has always been in another discipline, and at an institution far away, too far for anyone to take the trouble to check. Things are tough, to be sure, but they have been tough before. Presumably a man with an aching tooth finds small comfort in the knowledge that other teeth have also been known to ache, but this is not the first time that the job market for new Ph.D.'s has been tight; just ask any geographer who finished his graduate work in the mid 50s, or any geologist who began job-hunting

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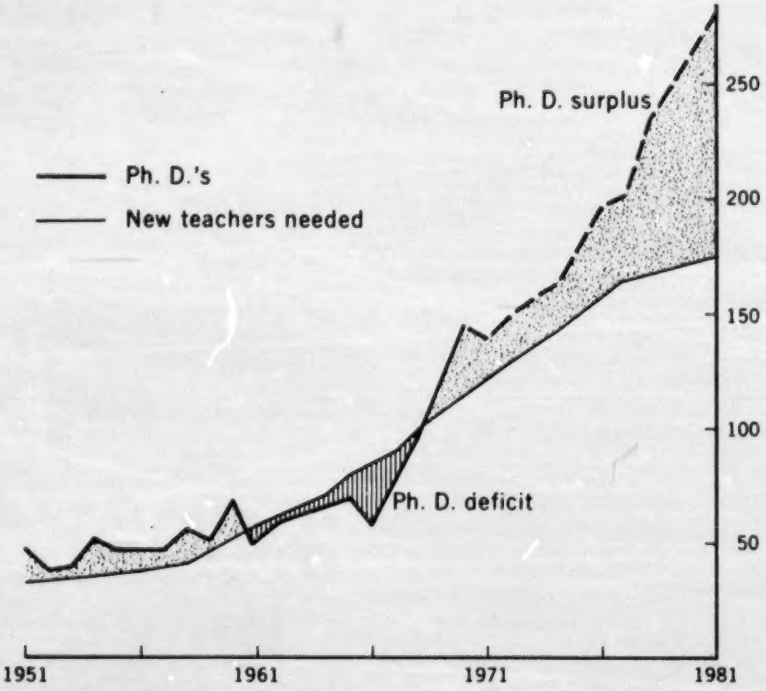

Fig. 4. The Ph. D. Surplus in Geography

for the first time when the major oil companies were cutting back on their expenditures for exploration.

The current "crisis" has been widely publicized not so much because it is novel as because it has affected such pampered disciplines, of such high visibility, and so many of them simultaneously. Practitioners of mathematics, physics, chemistry, and engineering, for example, have been cosseted by our nation ever since the atomic bomb, but especially since sputnik, and too many of them have taken lavish expenditures of Federal funds as only a fitting tribute to their superior qualities. Furthermore, they have learned well the techniques of informing the nation of their importance; a hundred unemployed English teachers may be a bore, but a hundred unemployed scientists is a national disaster, and hundreds of scientists were unemployed by the government cutbacks of 1968. The knife cut universities both directly, by reductions in contract research and fellowship programs, and indirectly, through cutbacks in defense and aerospace spending, which suddenly threw highly trained non-university people onto the university job market.

The predicament of the universities probably is going to get even worse before it begins to get better. On July 23, 1972, the *New York Times* reported an estimate that half a million vacancies in a total of eight million college seats available for the fall of 1972 would aggravate a financial situation which is already serious. Many institutions presumably will try to cut costs by reducing their faculties for the fall

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TABLE 3. ESTIMATED NEEDS FOR GEOGRAPHY TEACHERS AND PRODUCTION OF DOCTORATES IN GEOGRAPHY, 1960-1980

Year	New Geography Teachers Needed[a]	Doctorate Production Required[b]	Production of Doctorates[c]	Surplus or Deficit
1960	79	51	68	+17
1961	85	57	50	− 7
1962	92	60	58	− 2
1963	99	66	61	− 5
1964	109	71	67	− 4
1965	122	80	70	−10
1966	130	86	58	−28
1967	141	91	79	−12
1968	152	100	96	− 4
1969	164	108	124	+16
1970	174	114	145	+31
1971	186	123	139	+16
1972	198	131	149	+18
1973	208	137	157	+20
1974	218	143	164	+21
1975	230	151	182	+31
1976	240	157	197	+40
1977	251	165	202	+37
1978	256	168	233	+65
1979	262	171	247	+76
1980	265	174	265	+91

[a]Based on the assumption that the need for new full-time college teachers of geography will remain 0.0022 percent of total degree-credit fall enrollment in all institutions of higher education, as given in *Projections of Educational Statistics to 1980-81*, op. cit., footnote 5.

[b]Calculated on the assumptions that twenty-three percent of new full-time geography teachers will have their doctorates, and that approximately thirty-five percent of those who receive their doctorates will start teaching for the first time.

[c]As estimated in Table 2.

of 1973, which would decrease employment opportunities for new Ph.D.'s. Only five weeks earlier the same newspaper had reported a warning from the Carnegie Commission on Higher Education: the rate of increase in total national expenditures for higher education must be trimmed by approximately twenty percent. The Commission suggested that this could be achieved by reducing the length of the normal undergraduate program to three years, by reducing the number of "reluctant students," by declaring a moratorium on new Ph.D. programs, and by increasing faculty teaching loads by about three hours a week.

Another national trend which probably bodes no good for geography or for other small disciplines is the atomization of enrollment in the first two years of college, because this could preclude contact with and recruitment of prospective major students in introductory classrooms. Two-year community colleges, the keen cutting growth edge of higher education in the United States, opened at a rate of approximately one a week in the late 1960s. Their enrollment grew from about 600,000 in 1960 to two million in 1970, and is expected to double to four million by 1980. Few of them offer enough geography courses to justify the employment

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of a full-time person, and typically these courses are taught by whatever faculty member is available. Graduates of the two-year institutions, who have already elected a major, probably will bypass four-year geography departments which depend for their advanced enrollment on students recruited from their introductory classrooms by superior teaching. Where will we recruit geography majors if students take their first two years at institutions which offer little or no geography, and arrive on our campuses with their majors already declared?

Although the national picture looks remarkably bleak, and all signs seem to be pointing toward an awfully tough year in 1973, thus far the current academic recession has not hurt geography nearly as much as it has hurt some other disciplines. For example, we have not suffered too severely from the drying up of funding sources because we never had much access to them in the first place. Many geographers clearly have been rather less than aggressive in going after the funds that have been available, and some undoubtedly were startled to find expenditure of funds used as a primary measure of research activity in geography.[8] Perhaps the bad fortune that we bemoaned in good times may have been good fortune when times turned bad.

At the institutional level many geography departments have felt a ricochet effect of the academic recession because of restrictions on staff additions and replacements. Many administrators, faced with the necessity of trimming departments which suddenly are overstaffed because of cutbacks in external funding, and luxuriating in the discovery that hitherto unavailable engineers and physicists have become a dime a dozen, have been unable or unwilling to believe that geography could be all that different, that good geographers are still hard to find, or that geography departments could be understaffed, and legitimate requests for new staff members have been viewed with considerable suspicion or even rejected.

Geography had not been afflicted by any severe surplus of Ph.D.'s as late as the spring of 1971, if chairmen are to be believed, because a third of those who responded to the departmental questionnaire said that the number of applicants with doctorates had not increased, and some of those who said the contrary quite clearly were speaking on the basis of what they had read or heard rather than on their own hiring experience (Table 4). One chairman commented that "more people are available, but most of them are already employed and just seeking a change or a better job."

The strongest affirmative response came from the terminal masters departments, which presumably would have been first to feel the spillover if the number of qualified applicants had exceeded the number of jobs available in the more prestigious doctoral departments. Tightening up in demanding that new appointees have the doctorate appears to be a time-lag function of availability, although some doctoral department chairmen protested too much that they have always required the doctorate, and that their standards have not changed. "Have you stopped beating your wife?," huffed one irritated chairman, whose faculty of fourteen includes four people without doctorates!

The question concerning the non-research doctorate is a relic of the Ph.D. surplus (Table 4). Once upon a time, when new Ph.D.'s were happy to get a job, any job, they taught what they were told to teach, which was mainly the basic, bread-and-butter, introductory courses, although perhaps, if they were good little assistant professors, they might be given a chance to teach an advanced course in their

[8] Taaffe, op. cit., footnote 4, pp. 114-17.

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TABLE 4. PERCENTAGE OF RESPONDENTS WHO ANSWERED "NO" TO THREE QUESTIONS RELATED TO THE SURPLUS OF DOCTORATES

(1) Are more applicants with doctorates available in 1971?
(2) Have you tightened up in requiring the doctorate for new appointments in 1971?
(3) Would you appoint an applicant with a non-research doctorate?

Type of department	Question		
	(1)	(2)	(3)
All departments	32	49	45
Doctoral	32	55	61
Terminal masters	24	37	50
Undergraduate	35	47	35
Two-year	29	84	24
Canadian	38	44	81

research specialty every now and then. When Ph.D.'s became scarce, however, and chairmen had to start asking their new men what they wanted to teach instead of telling them what they were going to teach, young instructors arrogantly disdained to teach any courses outside their specialized areas of interest. Although many institutions and departments were forced by the job market to pander to this kind of arrogance, they began to demand a new kind of degree, a non-research doctorate or Doctor of Arts, whose recipients would expect to teach, and would not consider it beneath their dignity. The idea of a non-research doctorate, in short, was a product of the shortage of Ph.D.'s, and seems to have died with it.

Departmental attitudes toward hiring a person with a non-research doctorate are closely tied to status levels (Table 4). Most doctoral and masters departments reject the idea out of hand, and even those which are not completely negative would accept such a person only in special fields such as cartography, graphics, or geographic education, which some departments apparently do not consider legitimate areas of geographic research. Conversely, many undergraduate and two-year departments would prefer a person with a non-research doctorate, because they seem to have accepted the widespread myth that good teaching can be divorced from good research. Research and teaching are inseparable aspects of the process of tightly disciplined curiosity and communication which is known as scholarship. A true scholar combines an abiding curiosity with a burning urge to communicate the knowledge he has gained, whether to a narrow circle of listeners or to the wider audience made available by the printed page. Just as research without publication – a form of teaching – is not research, so teaching without research is mockery, the mere transmission of second-hand ideas and knowledge which lacks immediacy and excitement.

Teaching has been the customary vocation of professional geographers. Only six years ago most were complacently dependent upon college teaching jobs, and it would have been "foolish to try to develop new jobs for geographers when there are already too few to fill existing positions."[9] Teaching is not the only activity for which geographers are qualified, however, and the bleakness of the job picture can

[9] Hart, op. cit., footnote 1, p. 3.

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be greatly alleviated by consideration of alternative employment opportunities.[10] These opportunities are not going to open up automatically, however; they must be developed, and their development is going to demand large expenditures of time and energy by large numbers of geographers. We cannot expect some nebulous "them" to do the work for us; it is a do-it-yourself job, and the future prosperity of geography will depend in large measure on how well each individual geographer does it.

A change of attitude will be necessary. Too many academic geographers have taken no pains to conceal their contempt for nonacademic employment, and this attitude has been resented, strangely enough, by potential nonacademic employers. As a starter, these snooty fellows might begin to try to mend their fences and build bridges with their colleagues in Federal agencies. Two decades ago the geographic communities of Washington and Academe were linked by ties of professional respect and personal friendship which had been forged by men working side by side during World War II, but younger geographers began turning their backs on Washington. Today the academic ties of many geographers in Federal employment are mainly with their friends from graduate school, and vice versa. Such a situation would be embarrassing at any time, but it is intolerable today; ties between academic and government geographers should be broader and stronger, and the initiative must come from Academe. The future is bleak indeed if academic geographers cannot establish and maintain good relationships with their professional peers in Washington.

The future is also bleak for many geographers who wish careers in the academic world, unless they can change their attitudes; the days of the amateur have ended, and only tough professionals are going to succeed. The job market of the 1960s, which virtually guaranteed a college teaching job to anyone with an advanced degree in geography, gave many young people an inflated notion of their abilities and importance, and encouraged drifting. Too many students drifted into graduate school, they were tempted (and permitted) to drift through, and they drifted into good jobs where they happily busied themselves doing unimportant things while their talents and training became atrophied through lack of use.

The job market of the future is going to weed out the drifters and the nonproducers, if the experience of the past has any meaning. Academic jobs will continue to be available, but the competition for them will be much tougher, and young people will have less chance to dictate their terms of employment. Many of them will have to accept initial appointments below their levels of aspiration, and they will receive offers of better jobs only when they have demonstrated their scholarly capabilities, often at considerable personal sacrifice. This might not be a completely unmitigated disaster, because the experience of geography suggests that a leading graduate department is the worst possible place for a bright young man to attempt to begin a successful career as a productive scholar.

The job offer in early fall, a product of the Ph.D. shortage, probably will become less common; the practice was initiated by some of the less competitive institutions, which began to make early offers and demand immediate acceptance in order to

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[10] Preston E. James and Lorrin Kennamer, eds., *Geography As A Professional Field*, Department of Health, Education, and Welfare, Office of Education Bulletin 1966, No. 10 (OE-26015), Superintendent of Documents catalog number FS 5.266:26015 (Washington: Government Printing Office, 1966). Revised and reprinted by the Association of American Geographers and the National Council for Geographic Education, 1969.

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secure the staff they needed. The spring meetings will probably regain their former role as a hiring fair, and advisors will have to become more active in selling their students to prospective employers, at the meetings and elsewhere. "Publish or perish," which was reduced to little more than a myth by the job market of the 1960s, may once again become a fact of academic life, and the tenure decision may become meaningful, and traumatic, rather than a mere formality. (On 16 September 1972 the *New York Times* reported that the state's Chancellor of Higher Education has proposed limiting tenure to a maximum of 60 percent of a college's faculty.)

Quotas on degrees have been suggested as one possible solution to the Ph.D. surplus, but quotas appear undesirable even if anyone or any group were wise enough to set them and powerful enough to enforce them. Perhaps a moratorium on new advanced degree programs could be considered a kind of quota, but decisions about advanced degree programs will be made by institutions rather than by the profession, and as a general rule institutions tend to encourage the development of advanced degree programs because they are prestigious. More than one advanced degree program has been initiated because of institutional pressures, and against the better judgment of at least some of the faculty members involved.

Once a graduate department has been established, however, it becomes as immutable as a cemetery or a curriculum. It resents, and is impervious to, any attempt by an outside group, such as a professional association, to control it, which probably is as it should be; a farsighted department ought to be able to trim its own sails without external advice and assistance, and some have already started doing just that. Even if quotas would be accepted, however, the attempt to set them would pose some difficult and probably unanswerable questions: Should a bright young department be prevented from offering the doctorate because the old fuddy-duddy departments think they are already meeting the demand? Should a mature and experienced department be required to cut back its graduate program so that a second-rate faculty in a second-rate institution can enjoy the ego trip of giving second-rate doctorates to second-rate candidates? And how many doctorates should a mature and experienced department give up in order to let a bright young department get started?

DOCTORAL DEPARTMENTS

The *Guide to Graduate Departments of Geography* for 1970-1971 indicates that 51 geography departments were authorized to offer Ph.D. degrees, but only 39 exercised the right of conferring one or more between 1 July 1965 and 30 June 1970 (Table 5, Fig. 5). In the five-year period these 39 departments granted 502 doctorates, of which 21 (4.2 percent) went to women. The average department granted 12.9 degrees, or two to three a year. The West Coast seemed to be creeping up on the Middle West in total number of doctorates granted; three of the five largest doctoral departments, which granted 102 degrees (20.6 percent), were on the West Coast, but six of the ten largest (139 degrees, 27.7 percent) were in the Middle West. UCLA and Michigan State were the bellwether departments in individual growth between 1960-65 and 1965-70, but most departments granted so few doctorates that the majority of changes probably can be dismissed as mere quirks of statistics.

The doctoral departments also conferred significant numbers of first and second degrees. The ten largest doctoral departments alone awarded half of all the doctor-

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TABLE 5. GEOGRAPHY DEGREES CONFERRED BY DOCTORATE-GRANTING INSTITUTIONS BETWEEN 1 JULY 1965 and 30 JUNE 1970

Institution	Doctorate	Masters	Baccalaureate
University of California, Los Angeles	44	81	339
University of Washington	33	35	247
Michigan State University	29	69	120
University of Wisconsin, Madison	27	67	168
University of California, Berkeley	26	58	143
Louisiana State University	23	19	38
University of Chicago	22	39	12
University of Minnesota	21	55	188
Indiana University	20	54	59
University of Iowa	20	19	47
Clark University	19	36	57
Columbia University	18	20	25
University of Michigan	16	41	67
University of Florida	15	18	37
Ohio State University	15	23	68
University of Illinois, Urbana	14	48	63
University of Kansas	14	24	73
Johns Hopkins University	14	4	5
University of Nebraska, Lincoln	12	25	28
Pennsylvania State University	12	62	41
Northwestern University	11	30	7
University of North Carolina, Chapel Hill	10	18	41
Syracuse University	9	34	91
University of Oregon	9	20	65
University of Pittsburgh	8	12	77
University of Georgia	6	24	157
University of Tennessee	6	25	27
Boston University	5	4	43
University of Oklahoma	5	57	49
University of Colorado	3	37	81
Yale University	3	0	0
University of Cincinnati	3	26	46
George Washington University	3	7	37
S. Illinois University, Carbondale	2	36	129
University of Denver	1	10	36
University of Maryland	1	16	118
University of S. Mississippi	1	5	64
University of California, Davis	1	15	76
Columbia University Teachers College	1	19	0
Total, Doctorate Granting Institutions	502	1,192	2,969
Total, All Institutions	502	2,582	13,806

ates, a fifth of all the masters degrees, and a tenth of all the baccalaureate degrees in geography granted in the United States between 1965 and 1970. All 39 doctoral departments granted nearly half of all masters degrees and slightly more than a fifth of all baccalaureate degrees. These statistics emphasize the fact that a large graduate program and a large undergraduate program need not be mutually exclusive.

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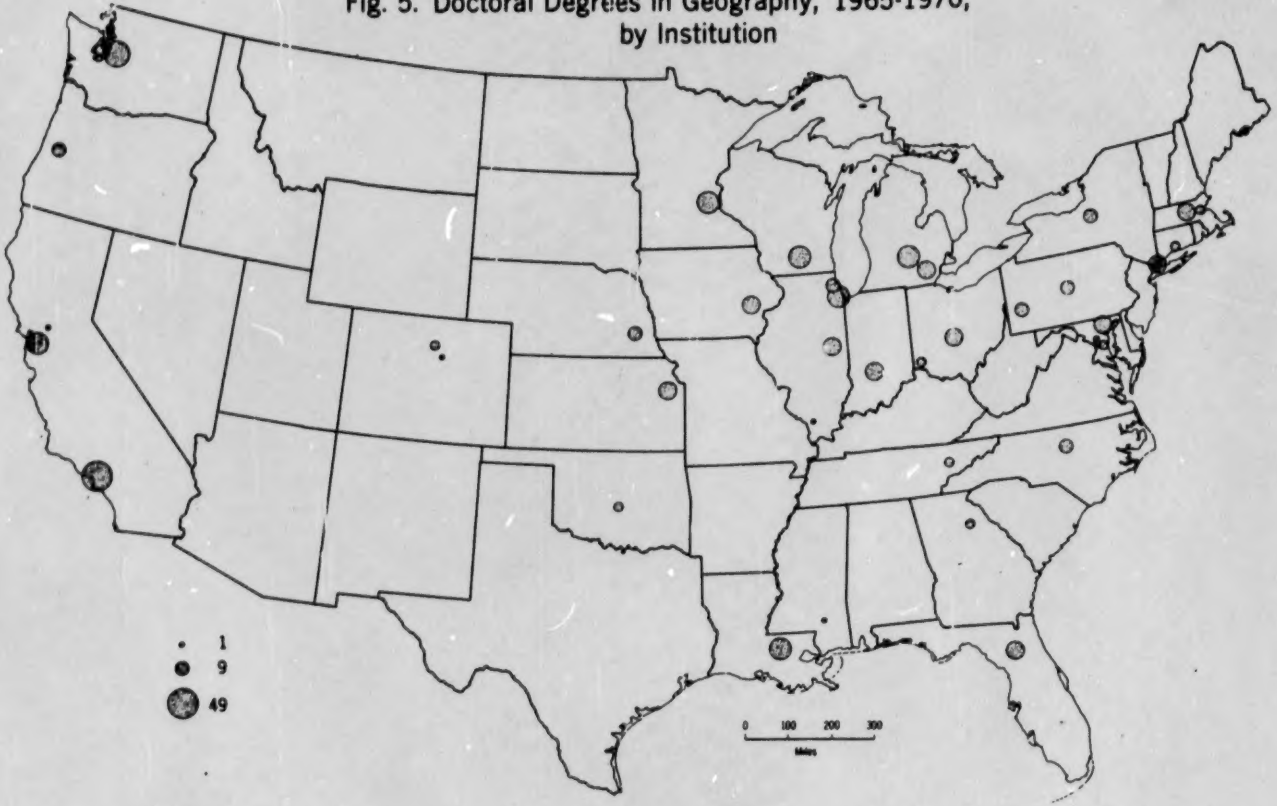
Fig. 5. Doctoral Degrees in Geography, 1965-1970, by Institution



Some departments concentrate upon their graduate programs and neglect undergraduates, however, perhaps without realizing that such behavior is considered parasitic by some of their colleagues in other geography departments. A crude index of degree imbalance might be based on the roughly one to six (502 to 2,969) ratio between the number of doctoral and baccalaureate degrees granted by all doctoral departments: a "normal" doctoral department might be expected to confer six times as many first degrees as doctorates, and the index is the number of baccalaureate degrees by which it falls short of this norm (Table 6). A desirable refinement of the crude degree imbalance index would be some form of weighting for the undergraduate/graduate student ratio at each institution in order to adjust for variations in the size of the undergraduate student bodies from which prospective majors can be recruited.

TABLE 6. CRUDE DEGREE IMBALANCE INDEX, 1965-70

Total number of baccalaureate degrees by which specified departments fell short of the national doctoral department ratio of six baccalaureate degrees for each doctorate.

Institution	Number
University of Chicago	120
Louisiana State University	100
Columbia University	83
Johns Hopkins University	70
University of Iowa	73
Indiana University	61
Northwestern University	59
University of Florida	53
Michigan State University	52
Clark University	47
University of Nebraska	44
Pennsylvania State University	31
University of Michigan	29
Ohio State University	22
University of Illinois	21
University of North Carolina	19
Yale University	18
University of California, Berkeley	13
University of Kansas	11
University of Tennessee	9

The traditional predominance of the Middle West in American geography shows up clearly in a tabulation of all Ph.D.'s in the 1970 AAG *Directory* (Table 7, Fig. 6).[11] This list obviously is incomplete, because it is biased toward those departments which have inculcated their doctoral candidates with a desire to maintain membership in the national professional association of geographical scholars. It was compiled in order to cast light on the age structure of Ph.D.'s in geography, and should not be considered a ranking of doctoral departments, although the fifteen leading departments, as rated on the widely-publicized American Council of Educa-

[11] *Directory* (Washington: Association of American Geographers, 1970).

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TABLE 7. DOCTORATES LISTED IN THE 1970 AAG DIRECTORY, BY GRANTING INSTITUTION, DATE GRANTED, AND MEDIAN AGE OF RECIPIENTS

Granting Institution	Date Granted						Total	Median age
	Before 1945	1945-1949	1950-1954	1955-1959	1960-1964	1965-1969		
Clark University	37	16	22	22	21	14	132	34
University of Chicago	25	14	21	9	18	14	101	31
University of Michigan	15	9	17	21	21	13	96	33
University of Wisconsin	15	2	12	15	22	24	90	32
University of Washington	2	4	12	16	19	25	78	32
Northwestern University	1	2	21	17	19	10	70	30
University of California, Berkeley	19	2	11	13	8	14	67	33
Syracuse University		1	8	16	12	10	47	32
University of California, Los Angeles			5	7	14	21	47	33
Ohio State University	5	2	7	10	6	15	45	32
Columbia University	11	2	4	7	6	12	42	35
University of Illinois			6	11	14	11	42	32
University of Iowa	1	1	6	5	10	17	40	32
University of Nebraska	8	1	5	9	7	8	38	37
Indiana University			3	5	8	19	35	34
Louisiana State University			2	6	8	12	28	32
University of Minnesota				4	10	13	27	33
Columbia Teachers College	2	3	4	5	7	3	24	35
Michigan State University	1				5	18	24	30
Pennsylvania State University		1	2	3	6	12	24	37
Harvard University	5	5	7	5	1		23	31
University of Florida			1	3	7	11	22	32
University of North Carolina	2	2	1	2	4	9	20	33
University of Maryland		3	5	5	5	1	19	38
Other U.S. and Canada[a]	12	8	18	28	37	88	191	34
Overseas	21	7	18	22	39	84	191	29
TOTAL	182	85	218	266	334	478	1563	33
Ed.D.'s	2	3	6	16	13	16	56	38

[a]Forty-seven institutions in the United States and six in Canada which have less than fifteen doctorates listed in the *Directory*, op. cit., footnote 2.

tion list, have a rank order coefficient of correlation of 0.835 with their positions on this list, if Clark (voted too low) and Minnesota (too high) be ignored.[12]

Before World War II significant numbers of doctorates in geography were granted by only a handful of departments: Clark, Chicago, Berkeley, Wisconsin, Michigan, Columbia, and Nebraska (Table 7). Clark, Chicago, and Michigan rapidly returned to the lists after the war, and Clark has maintained an average of about four doctorates a year, while Chicago and Michigan have hovered around three. Wisconsin and Berkeley were a bit slower to crank up, and Washington and North-

[12]Kenneth D. Roose and Charles J. Andersen, *A Rating of Graduate Programs* (Washington: American Council on Education, 1970), pp. 60-61.

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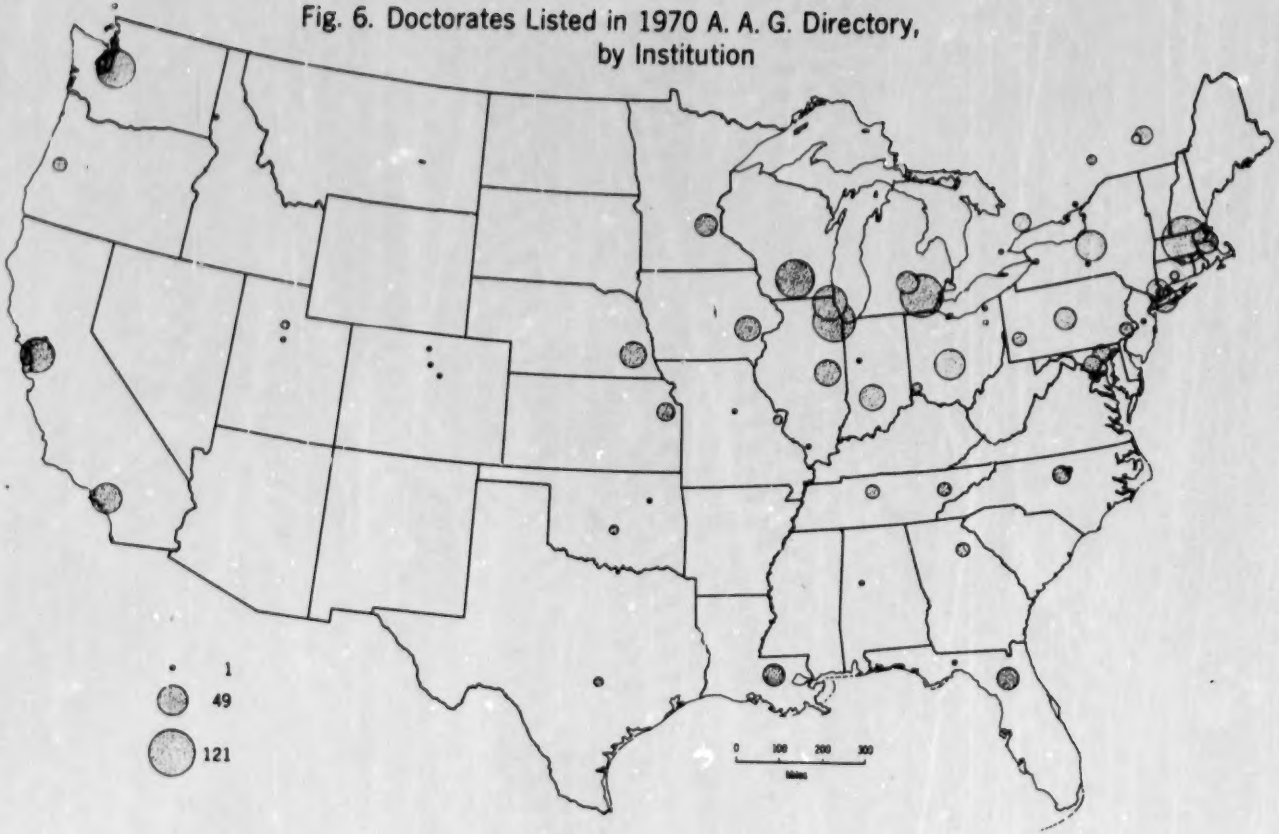
Fig. 6. Doctorates Listed in 1970 A. A. G. Directory, by Institution



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western were added to the group in the early 1950s. The ranks of major producers of geography doctorates were joined by Syracuse, Ohio State, and Illinois in the late 1950s, UCLA, Iowa, and Minnesota in the early 1960s, and Indiana and Michigan State in the late 1960s. These fifteen departments, of which ten are in the Middle West, are responsible for three-fifths of all doctorates listed in the 1970 AAG *Directory*, and for half of those granted since 1964.

Contrary to widespread myth, the median age (33 years) for the receipt of the doctorate has not varied greatly through time, nor from department to department (Table 7). The median age (30) of pre-1945 recipients is a bit low because older recipients are no longer active, and it is 34 or higher for the late 1940s when the veterans were back, but since 1950, when it dropped to 31, the median age of doctoral recipients has remained within a year of 33. Three-fifths of the doctoral departments are also within a year of the overall median. The most extreme groups are the callow youths who received their doctorates outside the United States and Canada at the tender median age of 29, and the oldsters who tottered up to receive their Ed.D.'s at the ripe old median age of 38.

Geography Ph.D.'s are a relatively young bunch. In 1970 their median age was 45 (Table 8). Only fifteen percent will have reached the traditional retirement age of 70 by 1982, and no more than a quarter will be eligible if the age of retirement is 65. Furthermore, the number of Ph.D.'s in the younger age cohorts will increase as more doctorates are granted, because anyone born after 1936 was still below the median age for receipt of the doctorate when the *Directory* was compiled. The ink is still damp on a lot of geography sheepskins. Thirty percent of the doctorates listed in the *Directory* had been received within the preceding five years, fifty-two percent in the preceding ten, sixty-nine percent in the preceding fifteen, and eighty-three percent in the preceding twenty. Any geographer who received his doctorate in 1950 or earlier is a real old-timer.

TABLE 8. DOCTORATES LISTED IN THE 1970 AAG DIRECTORY, BY DATE OF BIRTH

Date of birth	Number	Percentage
1942 – 1945	21	1.3
1937 – 1941	191	12.3
1932 – 1936	218	13.9
1927 – 1931	277	17.8
1922 – 1926	247	15.8
1917 – 1921	210	13.4
1912 – 1916	163	10.4
1907 – 1911	111	7.1
1902 – 1906	59	3.8
Before 1902	66	4.2
Total	1,563	100.0

MASTERS DEGREES

Between 1965 and 1970 a total of 125 geography departments granted 2,582 masters degrees, with 424 (16.4 percent) going to women (Table 9, Fig. 7). The average department granted 20.6 degrees, or roughly four a year. The ten largest

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TABLE 9. GEOGRAPHY DEPARTMENTS WHICH GRANTED AT LEAST 25 MASTERS DEGREES, OR AT LEAST 5 TO WOMEN, 1965-1970

Institution	Total	Granted to women	
		Number	Percentage
UNITED STATES	2,582	424	16
University of California, Los Angeles	81	14	17
Michigan State University	69	17	24
University of Wisconsin, Madison	67	19	28
Pennsylvania State University	62	8	13
University of California, Berkeley	58	13	22
University of Oklahoma	57	8	14
Arizona State University	56	6	11
University of Minnesota	55	12	22
West Chester State College	55	2	4
Indiana University	54	7	13
St. Louis University	52	25	48
University of Illinois	48	7	15
Chicago State College	47	8	17
University of Missouri	43	8	19
Eastern Michigan University	42	5	12
University of Michigan	41	11	27
Indiana State University	41	5	12
Kent State University	41	5	12
Indiana University of Pennsylvania	41	0	0
University of Chicago	39	15	38
San Fernando Valley State College	38	4	10
University of Colorado	37	10	27
Oregon State University	37	3	8
Clark University	36	4	11
Southern Illinois University, Carbondale	36	3	8
University of Washington	35	6	17
Rutgers University	34	4	12
Syracuse University	34	4	12
Memphis State University	32	10	31
University of Hawaii	32	5	16
Western Michigan University	31	3	10
Northwestern University	30	5	17
Miami University	29	5	17
Florida State University	29	3	10
Oregon College of Education	28	5	18
Marshall University	28	3	11
University of Cincinnati	26	1	4
University of Wisconsin, Milwaukee	25	5	20
University of Tennessee	25	2	8
University of Nebraska in Lincoln	25	1	4
Catholic University	22	9	41
Columbia University	20	10	50
Valparaiso University	19	7	37
Louisiana State University	19	5	26
University of Alabama	16	5	31

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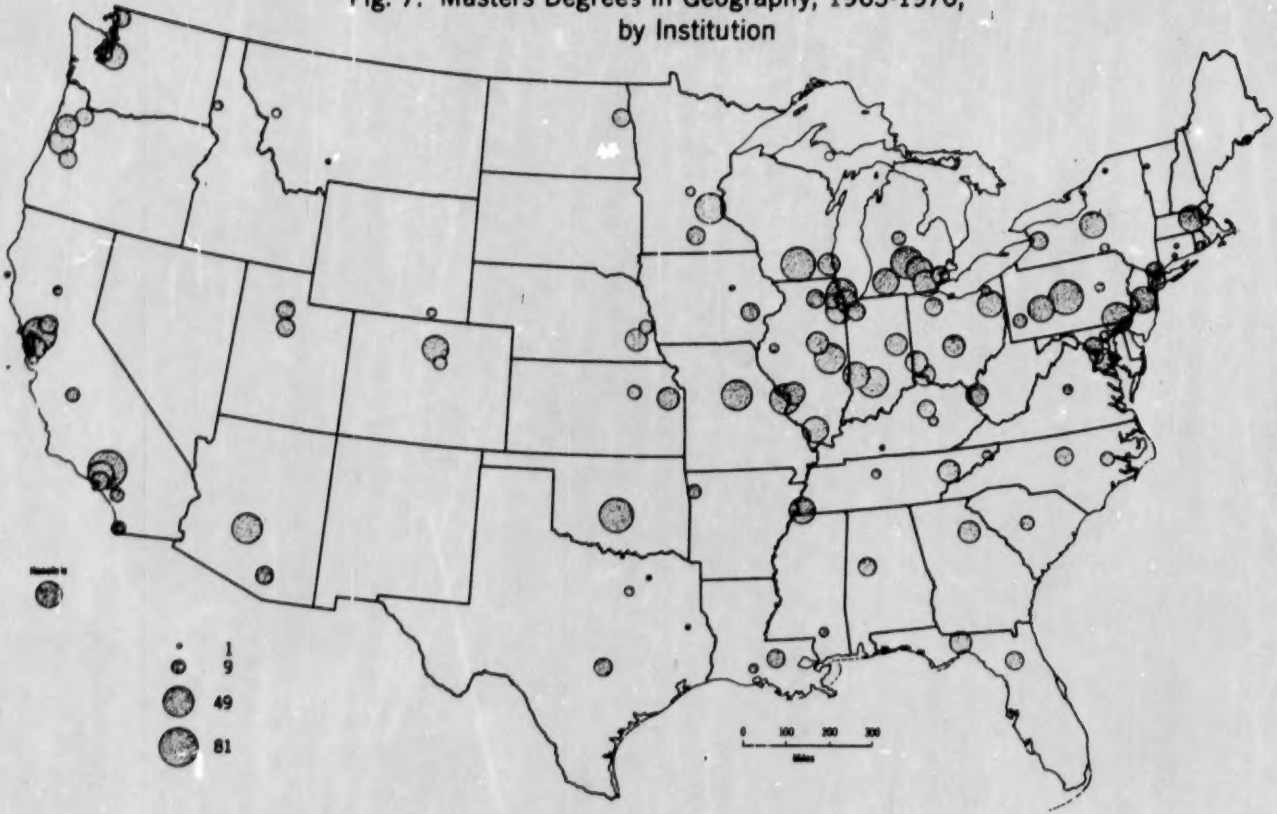
Fig. 7. Masters Degrees in Geography, 1965-1970, by Institution



departments granted nearly a quarter of all masters degrees, and the twenty-eight largest granted more than half; twenty of these largest masters departments also offered the doctorate.

The masters degree in geography appears to have at least three distinct roles. It does not seem to be regarded very highly or taken very seriously in many doctoral departments; it is awarded almost incidentally, as a token of progress, to students en route to the doctorate, or it serves as a consolation prize for those who won't make it. Most doctoral departments, however, have neglected the possibility of using the masters degree to develop a strong vocational program for students who are not particularly interested in an academic career.

The masters is taken much more seriously in departments where it is the terminal degree. Successful graduate programs in such departments commonly have a strong professional or vocational emphasis which prepares students for immediate employment in education, planning, or government. The graduates of such programs may have considerable difficulty if they wish to continue graduate work, however, because many doctoral departments are reluctant to accept entering graduate students who already have a masters degree, in part because they take their own masters degrees so lightly, and in part because sad experience has taught them that such people often have to be "diseducated."

Some of the smaller masters degree programs appear to function primarily as departmental status symbols. Despite the disadvantages associated with the masters degree, the number of geography departments which offered it increased at a more rapid rate (44 percent) between 1965 and 1970 than the number which offered either the baccalaureate (31 percent) or the doctorate (22 percent). Although the suggestion will not be very popular, perhaps those geography departments which confer less than four masters degrees a year should give serious thought to the possibility of eliminating their graduate programs and concentrating their resources on undergraduate instruction and on faculty research.

CAREER PREFERENCES OF GRADUATE STUDENTS

An earnest effort was made to get a copy of the graduate student questionnaire into the hands of every graduate student in residence in the spring of 1971 (Appendix B). Completed forms were received from 1,228 students, of whom 803 aspired to the Ph.D. and 425 expected to be satisfied with a masters degree.[13] These students probably represent more than half but less than two-thirds of geography graduate students in residence at that time.

The doctoral candidates desire academic careers (Table 10). Two-thirds checked university teaching as their first choice and college teaching second, although ten percent did not even bother to indicate a second choice. One-fifth reversed the order, placing college teaching first and university teaching second; junior college teaching was the handsdown third choice. There simply will not be enough academic jobs for all the doctoral candidates who desire them, however, and it is rather frightening to discover that these candidates do not seem to have a very high opinion of nonacademic careers. Federal employment, which appears to have been the least distasteful, was the first choice of only 4 percent, second choice of 12

[13] Steven K. Pontius performed the tiresome tedious thankless task of tabulating the returned questionnaires, and this section is largely the result of his labors, for which I am exceedingly grateful.

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percent, and third choice of 14 percent. It seems quite clear that many people with doctorates are going to wind up working for Federal agencies, private industry, or state and local government agencies, despite the fact that these three types of employment were listed among the first three choices of only 30, 17, and 16 percent of the students, respectively.

Junior college teaching was the first career choice of one-fifth of the masters candidates, and almost half anticipated jobs in government or industry, but 18 percent were unrealistic enough to hope for jobs in the overcrowded college/university market. The surplus of Ph.D.'s in the college market presumably will push some of them into the junior college market, and people with only a masters degree may well be pushed elsewhere, although only 48 percent included Federal employment among their first three career choices, 41 percent included state and local government, and 39 percent included private industry.

TABLE 10. FIRST CAREER CHOICE OF GRADUATE STUDENTS IN RESIDENCE, SPRING 1971, BY DEGREE ANTICIPATED

	Number		Percentage	
Career choice	Doctorate	Masters	Doctorate	Masters
University teaching	539	28	67	7
College teaching	144	48	18	11
Junior college	15	81	2	19
Elementary/secondary	6	48	–	11
Federal government	35	71	4	17
Local government	14	62	2	14
Private industry	21	54	3	13
Other or undecided	29	33	4	8
Total	803	425	100	100

The greatest numbers of doctoral candidates feel best qualified to teach human/cultural geography or urban geography, with landforms/geomorphology and economic geography as rather weak seconds, and nearly everything else as an also-ran (Table 11). If the standard course titles are grouped into the five broad "interest clusters" of contemporary geography, however, urban/economic/quantitative geography, physical geography, and cultural/historical geography each claims the primary interest of about a quarter of the doctoral candidates, but regional geography claims less than ten percent, and cartography less than five.

The topical specialties of geography graduate students are just as diverse as the field itself (Table 12). Urban, cultural, and economic lead the pack, but masters candidates have rather less interest than doctoral candidates in specialties such as historical, population, and political geography, which are primarily oriented toward the classroom, and they tend more toward such practical and applied specialties as urban planning, regional planning, and cartography, which makes their lack of interest in quantitative techniques and electronic data processing somewhat surprising.

A query about the geographic area specialties of graduate students seems to have been a waste of paper, because regional specialization appears to have become unfashionable in contemporary geography. A generation ago every geographer was

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expected to have a regional specialty and a topical specialty, but today the regional specialist is an area studies man who does not concern himself overly much with any particular topical specialty, and many topical specialists are not interested in any particular region. Eleven percent of the doctoral candidates in geography did not bother to check a single regional interest. Roughly a fifth checked North America or Anglo-America, and another fifth checked the United States, as first choice (Table 13). Latin America was the most popular overseas region, followed by Asia, Europe, and Africa, but three-fifths of the geography graduate students disclaimed interest in any area outside their own continent.

TABLE 11. FIRST TEACHING PREFERENCE OF DOCTORAL STUDENTS IN RESIDENCE, 1971

Teaching preference	Number	Percentage	
Physical geography	33	4.1	
Landforms/geomorphology	74	9.2	
Climatology/meteorology	30	3.7	
Biogeography/soils	21	2.6	
Conservation	44	5.5	
Subtotal			25.1
Urban geography	115	14.3	
Economic geography	73	9.1	
Quantitative techniques	24	3.0	
Subtotal			26.4
Human/cultural geography	132	16.4	
Historical geography	35	4.4	
Political geography	30	3.7	
Subtotal			24.5
Latin America	28	3.5	
North America	16	2.0	
World regional geography	13	1.6	
Europe	4	0.5	
Subtotal			7.6
Cartography	27	3.4	3.4
Other	103	13.0	13.0
Total	802		100.00

TEACHING JOBS

The departmental questionnaire was designed to obtain information from chairmen about their staffing plans, and the graduate student questionnaire was designed to elicit information about their qualifications. Returns from about half of the geography departments and half to two-thirds of the graduate students in residence in the spring of 1971 present a very incomplete quantitative picture of a complex job market, and provide no information whatsoever about the quality of the jobs or the quality of the people who will be applying for them. Furthermore, the data are more than a year and a half out of date, but they seem worth presenting here because they are better than anything else that is available, despite their manifest imperfections.

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TABLE 12. FIRST AND SECOND CHOICES OF TOPICAL SPECIALITIES BY GRADUATE STUDENTS IN RESIDENCE, 1971

	Doctoral candidates		Masters candidates	
Topical specialty	Number	Percentage	Number	Percentage
Total number	1,500	100.0	732	100.0
Urban geography	154	10.3	62	8.5
Cultural geography	141	9.4	51	7.0
Economic geography	121	8.1	47	6.4
Geomorphology	82	5.5	32	4.4
Historical geography	67	4.5	20	2.7
Physical geography	66	4.4	46	6.3
Conservation	61	4.1	29	4.0
Quantitative techniques	58	3.9	5	0.7
Political geography	48	3.2	11	1.5
Population geography	47	3.1	11	1.5
Climatology	46	3.1	26	3.6
Agricultural geography	38	2.5	14	1.9
Transportation geography	37	2.5	19	2.6
Electronic data processing	33	2.2	5	0.7
Urban planning	31	2.1	40	5.5
Recreational geography	26	1.7	21	2.9
General cartography	25	1.7	19	2.6
Resource geography	23	1.5	16	2.2
Regional geography	22	1.5	23	3.1
Anthropogeography	21	1.4	7	1.0
Regional planning	21	1.4	38	5.4

TABLE 13. FIRST CHOICE OF REGIONAL SPECIALTY BY GRADUATE STUDENTS, 1971

	Doctoral candidates		Masters candidates	
Region	Number	Percentage	Number	Percentage
None	90	11.2	49	11.5
World	47	5.8	43	10.1
North America	72	9.0	24	5.7
Anglo-America	83	10.3	33	7.8
Canada	48	6.0	52	12.2
United States	148	18.4	109	25.6
Latin America	98	12.3	17	4.0
Europe	61	7.6	37	8.7
Asia	71	8.8	16	3.8
Africa	45	5.6	22	5.2
Other	40	5.0	23	5.4
Total	803	100.0	425	100.0

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Fall staff appointments for 1971 and 1972 have been broken down by teaching specialties using, insofar as possible, the titles used by chairmen in describing them (Tables 14 and 15). Fractional listings are explained by the fact that a job involving two specialties was split into halves, and one involving three into thirds, but no job was quartered. Departments were categorized in terms of their highest degree offered as doctoral, masters, undergraduate, or two-year, and the Canadian departments are listed separately.

TABLE 14. TEACHING SPECIALTIES OF NEW GEOGRAPHY DEPARTMENT FACULTY MEMBERS, FALL 1971, BY TYPE OF DEPARTMENT

	Type of Department[a]					
Teaching specialty	D	M	U	T	C	Total
Total number of jobs	36.00	59.00	72.00	7.00	27.00	201.00
Near doctorate		2.00	4.00			6.00
Masters degree				2.00		2.00
Head of department			1.00			1.00
General/Introductory				1.00		1.00
World regional		0.33	4.50			4.83
Physical	3.50	4.33	6.33	0.50		14.67
Landforms/Geomorphology			1.83	1.00	1.50	4.33
Climatology/Meteorology	2.50	3.50	2.17		5.50	13.67
Biogeography/Ecology/Soils	4.50	2.00	0.83		3.00	10.33
Conservation/Resources	2.00	1.17	3.00	0.50	2.33	9.00
Perception		0.33	1.00		0.50	1.83
Economic	4.33	5.33	5.83		2.00	17.50
Transportation	0.50	0.50	1.67		0.50	3.17
Urban	3.33	5.00	7.83		3.33	19.50
Human/Cultural/Social	5.33	3.50	4.33	1.00	1.50	15.67
Population		1.83	1.67		1.00	4.50
Historical	2.83	0.50	2.50		1.00	6.83
Political		3.33	1.67			5.00
Recreation		0.33			2.00	2.33
History and philosophy			0.67			0.67
Education	1.00	2.00				3.00
Cartography		3.50	2.83		0.50	6.83
Air photo			1.50			1.50
Remote sensing	0.50	1.50	1.17	0.50		3.67
Quantitative	1.33	3.17	4.17		1.50	10.17
Field methods		0.33	1.00			1.33
Latin America	2.50	4.83	5.83			13.17
South and East Asia	0.50	4.83	2.50		0.50	8.33
Africa		2.50	1.50			4.00
Europe	0.33	1.33	0.67			2.33
USSR	1.00					1.00
North America		1.00		0.50	0.33	1.83

[a]D = doctoral department, M = masters department, U = undergraduate department, T = two-year department, C = Canadian department

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TABLE 15. TEACHING SPECIALTIES DESIRED WHEN APPOINTING NEW GEOGRAPHY FACULTY MEMBERS, FALL 1972, BY TYPE OF DEPARTMENT[a]

	Type of Department[b]					
Teaching specialty	D	M	U	T	C	Total
Total number of jobs	18.00	36.00	57.00	9.00	11.00	131.00
Near doctorate			1.00	1.00		2.00
General/Introductory				2.00		2.00
World regional		0.50	0.50			1.00
Physical		4.83	7.67	3.33		15.83
Landforms/Geomorphology			1.00		2.00	3.00
Climatology/Meteorology		1.50	2.50		1.00	5.00
Biogeography/Ecology/Soils	2.00	3.00			2.00	7.00
Conservation/Resources	3.00	1.33	4.00		0.50	8.83
Perception	0.50	0.50	1.00			2.00
Economic	3.17	4.17	5.00	1.00	1.50	14.83
Transportation	1.50		1.50		1.00	4.00
Urban	4.17	4.00	10.67			18.83
Human/Cultural	2.00	1.83	2.50	1.00	1.00	8.33
Population		0.33	0.50			0.83
History and philosophy		0.83				0.83
Education	0.50	0.50	1.83			2.83
Cartography		2.00	1.67		1.00	4.67
Air photo		1.00	1.83			2.83
Remote sensing		1.00	1.33			2.33
Quantitative	1.17	4.67	6.33		1.00	13.17
Field methods		0.33	0.50			0.83
Latin America		1.50	1.00	0.33		2.83
South and East Asia		0.33	2.33	0.33		3.00
Africa		1.00	1.00			2.00
Europe			0.67			0.67
USSR		0.33	0.67			1.00
North America		0.50				0.50

[a]Based upon questionnaires returned in the spring of 1971.

[b]D = doctoral department, M = masters department, U = undergraduate department, T = two-year department, C = Canadian department.

The job lists for 1971 and 1972 differ significantly, which should be fair warning against attaching any great importance to either one of them, and a detailed specialty-by-specialty comparison of numbers of jobs and numbers of graduate students, although intriguing, probably is not worth the paper that would be required, but nobody is going to stop you from doing it yourself if you consider it worthwhile. Perhaps a word is in order, however, about the manner in which broad "interest cluster" categories in geography have changed since 1966. Physical geography has risen from about 25 to 30 percent of the total job market, mainly because of increased emphasis on biogeography, ecology, and resource management. The urban/economic/quantitative cluster rose from 25 to 35 percent, the

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cultural/historical cluster remained around 15, the cartography/air photo/remote sensing cluster stayed just under 10, and demands for geographers with specific regional interests dropped from 25 percent to 10 percent.

BACCALAUREATES

Between 1 July 1965 and 30 June 1970 a total of 304 geography departments granted 13,806 baccalaureate degrees, of which 2,939 (21.2 percent) were granted to women (Table 16). The number of granting departments was only 31 percent larger than in the preceding five-year period, but the number of degrees granted had increased by 131 percent. The average department granted 45.4 degrees, or about nine a year.

The center of gravity of undergraduate geography in the United States seems to be shifting toward the West Coast, which had the six largest undergraduate departments in the nation (Fig. 8). The state of California alone accounted for 17.7 percent of all undergraduate degrees in geography, and Washington and Oregon raised the West Coast total to 23.1 percent. In the East four big states (Wisconsin, Pennsylvania, Illinois, and Michigan) accounted for another 26.1 percent, leaving only half of the total for the other forty-three.

The departmental questionnaire asked chairmen for information about the career plans of their 1971 graduates (Appendix A). The responses indicate that only the highest degree it offers seems to be taken very seriously by a department, despite lip service to the contrary. A few departments have demonstrated superbly well that it is possible to take a keen interest in all students and to treat them all, at whatever degree level, as individuals, but most doctoral department chairmen do not seem particularly interested even in the numbers of warm bodies in their masters and undergraduate programs, terminal masters department chairmen have remarkably hazy information about their undergraduates, and only the chairmen of nongraduate departments seem to know or care much about the numbers and interests of the people who are working toward baccalaureate degrees.

Working with the section of the departmental questionnaire dealing with the career plans of June and August 1971 graduates was a bit like playing the old game of ten little Indians. Questionnaires were mailed to 368 departments in the United States and 18 in Canada, but only half (186 and 16) were returned. Thirty-seven chairmen said that their departments do not grant baccalaureate degrees in geography, so then there were 165. Thirty of these were completely useless because the chairman was unable or unwilling to read, understand, and comply with simple instructions, or because he was woefully ignorant of the career plans of his undergraduate majors, or both. One helpful chairman, for example, replied that "many," "probably several," and "probably none" of his graduates would seek specific careers, and then waxed expansive and wrote "Armed Forces, marriage, travel, return to homemaking, airlines, et. al." when he came to the "others" category. Many of the more quantitatively oriented chairmen noted that their figures were only highly subjective estimates or very crude guesses.

The 135 departments which returned more or less useful questionnaires probably granted about a third of all baccalaureate degrees in geography between 1965 and 1970. Although the actual numbers presumably are not very meaningful, a percentage breakdown by broad categories reveals in broad outline the kinds of careers anticipated by students majoring in geography in the spring of 1971. Roughly two-fifths expected to become school teachers, a quarter planned to go on to

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TABLE 16. GEOGRAPHY DEPARTMENTS WHICH GRANTED MORE THAN ONE HUNDRED BACCALAUREATE DEGREES, 1965-1970

Institution	Total	Granted to women	
		Number	Percentage
UNITED STATES	13,806	2,939	21
University of California, Los Angeles	339	157	47
California State College, Long Beach	305	119	39
San Fernando Valley State College	293	63	21
University of Washington	247	86	35
San Francisco State College	223	85	38
California State College, Los Angeles	216	81	37
E. Carolina University	212	13	6
University of Minnesota, Minneapolis	188	23	12
SUNY at Buffalo	184	21	11
W. Michigan University	177	55	31
University of Wisconsin, Madison	168	33	20
Eastern Michigan University	158	18	12
University of Georgia	157	27	17
Indiana University of Pennsylvania	157	21	13
California State College, Fullerton	144	58	40
University of California, Berkeley	143	72	50
Mankato State College	13[illegible]	8	6
Fresno State College	13[illegible]	22	17
East Tennessee State University	12[illegible]	15	12
Southern Illinois University, Carbondale	12[illegible]	7	5
Illinois State University	125	21	17
Chico State College	125	17	14
Michigan State University	120	20	17
St. Louis University	119	66	55
University of Maryland	118	20	17
Wisconsin State University, Oshkosh	116	10	9
Morehead State University	115	6	5
Dartmouth College	115	0	0
Wisconsin State University, Whitewater	111	13	12
Central Washington State College	110	15	14
Clarion State College	109	8	7
St. Cloud State College	108	16	15
Middlebury College	106	42	39
University of Wisconsin, Milwaukee	104	8	8
Western Washington State College	103	21	20
San Jose State College	102	24	24
Eastern Kentucky University	102	12	12
Brigham Young University	102	7	7

graduate school, a sixth expected to seek government employment, and a tenth hoped to find jobs in private industry (Table 17). The largest departments had a higher percentage of students who expected to become school teachers and a smaller percentage of prospective graduate students. Females, especially in the larger departments, were overwhelmingly oriented toward school teaching, and only a small fraction planned to go to graduate school.

Fig. 8. Baccalaureate Degrees in Geography, 1965-1970, by Institution

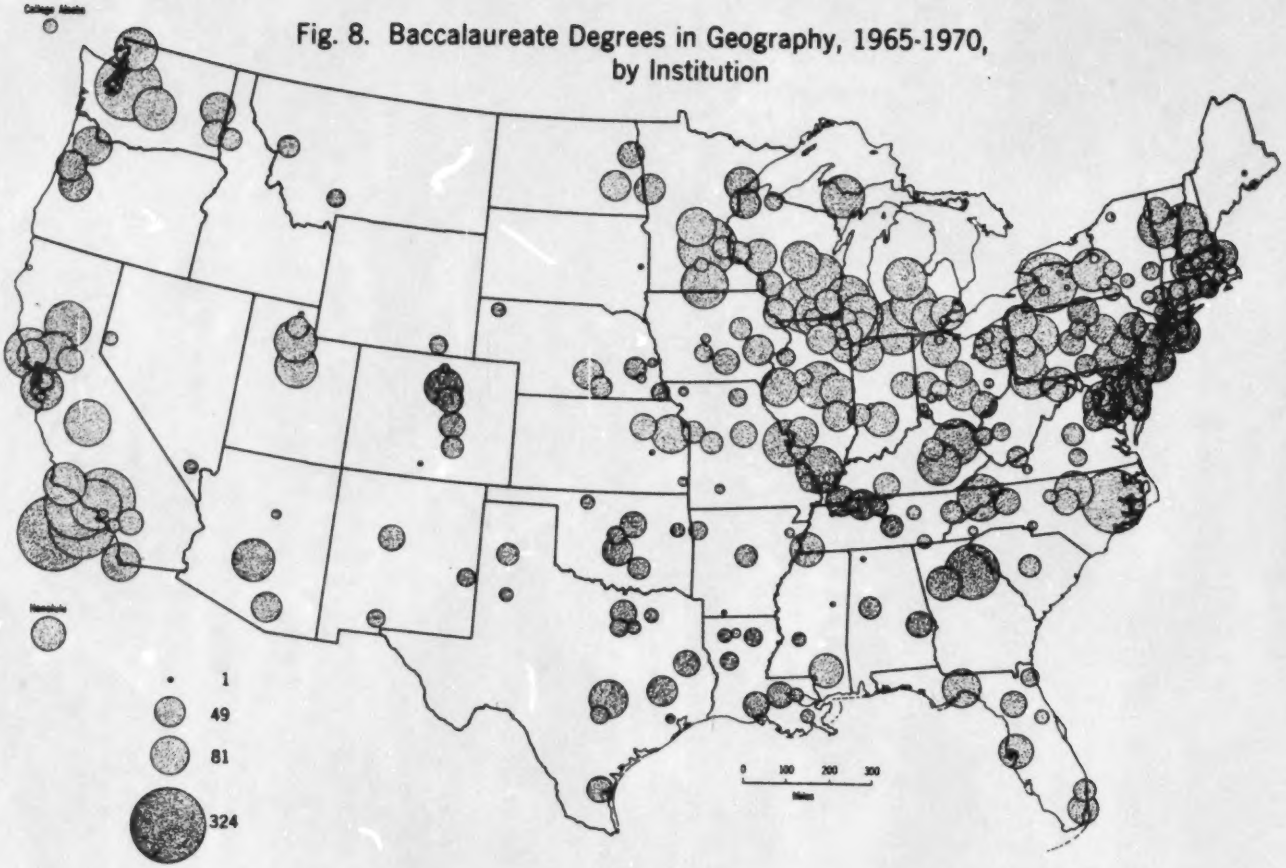

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TABLE 17. PERCENTAGE OF JUNE AND AUGUST 1971 BACCALAUREATE RECIPIENTS WHO PLAN CAREERS SPECIFIED, BY SIZE OF DEPARTMENT

Career anticipated	Size of Department[a] L	M	S	C	Total
ALL GRADUATES					
Total	100	100	100	100	100
Elementary/secondary teaching	54	38	43	39	42
Graduate school	18	25	23	25	23
Private industry	9	9	8	9	9
Federal agencies	4	6	9	8	7
State/local agencies	5	11	7	11	9
Other, undecided, unknown	10	11	10	8	10
MALES					
Total	100	100	100	100	100
Elementary/secondary teaching	41	33	33	37	35
Graduate school	21	27	27	27	26
Private industry	11	9	11	10	10
Federal agencies	5	7	11	8	9
State/local agencies	8	11	8	10	9
Other, undecided, unknown	14	13	10	8	11
FEMALES					
Total	100	100	100	100	100
Elementary/secondary teaching	84	51	69	47	63
Graduate school	10	19	12	18	15
Private industry	4	8	2	5	5
Federal agencies	1	4	4	9	4
State/local agencies	0	11	3	12	6
Other, undecided, unknown	1	7	10	9	7

[a]L = large departments which conferred 125 or more baccalaureate degrees between 1965-66 and 1969-70, M = medium departments which conferred 50 to 124 degrees, S = small departments which conferred less than 50 degrees, and C = Canadian departments.

WHERE ARE THE WOMEN?

The paucity of prospective graduate students among female undergraduate majors is a reminder that geography departments in the United States have not been very successful in recruiting females. The performance at the doctoral level between 1965 and 1970 was pathetic; only 21 of 502 doctorates (4.2 percent) went to women. It was a bit better at the masters level, 424 of 2,582 for 16.2 percent, but only 31 of the 125 masters departments averaged as high as one masters degree a year to a woman over the five-year period (Table 9).

At the baccalaureate level, 2,939 of 13,806 degrees (21.3 percent) went to women, mainly because of California. The state's geography departments granted 17.7 percent of the nation's baccalaureate degrees between 1965 and 1970, but 28.8 percent of all those which went to women. During this period 38 departments granted more than one hundred first degrees; California had 8 of the 12 which

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granted more than twenty percent to women, but only 2 of the 26 which fell below the national norm (Table 16). Apparently anyone who wishes to recruit more females into geography must look to the Golden State for guidance.

The list of geography departments which granted women at least ten baccalaureate degrees, and which granted at least 21 percent of their baccalaureate degrees to women, might be considered a kind of feminists's honor roll of smaller geography departments (Table 18). Apart from their success in recruiting females, these departments seem to have nothing in common; some are in major metropolitan centers, but some are in small towns; some are in large state universities, but some are in small colleges; and some, but by no means all, are in predominantly female institutions.

TABLE 18. DEPARTMENTS WHICH GRANTED WOMEN AT LEAST TWENTY-ONE PERCENT AND AT LEAST TEN OF THEIR BACCALAUREATE DEGREES, 1965-1970

Institution	Total	Granted to women	
		Number	Percentage
Central Michigan University	97	26	27
University of Illinois, Chicago Circle	93	26	28
University of California, Santa Barbara	92	23	25
Valparaiso University	86	25	29
Boston State College	84	39	47
University of Texas	83	49	59
University of Colorado	81	25	31
CUNY Hunter College	80	54	67
University of California, Davis	76	40	52
Georgia State University	70	39	56
University of Michigan	67	26	39
Wayne State University	67	22	33
University of Illinois, Urbana	63	22	35
Chicago State College	63	17	27
Clark University	57	23	40
University of Miami	54	12	22
Miami University	50	13	26
University of Oklahoma	49	15	31
Sonoma State College	47	11	23
De Paul University	46	16	35
Boston University	43	11	27
Stephen F. Austin State University	41	10	24
Auburn University	37	14	38
University of California, Riverside	37	14	38
University of Denver	36	12	33
Sacramento State College	35	14	40
University of Vermont	34	16	47
Northeastern Illinois State College	33	13	39
Macalester College	28	13	46
Briarcliff College	26	26	100
Mary Washington College	25	25	100
Vassar College	17	17	100
Longwood College	13	13	100
Mount Holyoke College	13	13	100

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Name of your institution: _____

CAREER PLANS OF JUNE AND AUGUST 1971 GRADUATES	MALE	FEMALE
TOTAL NUMBER OF GRADUATES	_____	_____
Teach in elementary/secondary school	_____	_____
Enter graduate school	_____	_____
Work in private industry	_____	_____
Work for Federal agencies	_____	_____
Work for state/local government agencies	_____	_____
Other	_____	_____

TEACHING SPECIALTIES OF NEW APPOINTEES, FALL 1971 (None ☐)

N R _____

N R _____

N R _____

N R _____

N R _____

TEACHING SPECIALTIES OF ANTIPICATED APPOINTMENTS, FALL 1972 (None ☐)

1) _____

2) _____

3) _____

	YES	NO
Are more applicants with doctorates available this year?	☐	☐
Have you tightened up in requiring the doctorate for new appointments this year?	☐	☐
Would you appoint an applicant with a non-research doctorate?	☐	☐

Please return to: **GEOGRAPHIC MANPOWER SURVEY**
Department of Geography
University of Minnesota
Minneapolis, Mn., 55455

APPENDIX A

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Dear Graduate Student:

This questionnaire is part of an attempt to update the report on geographic manpower which was published by the Commission on College Geography in 1966. Please complete it carefully and return it to the departmental office.

Please circle the highest degree to which you aspire: MA/MS ABD PhD

In what year do you expect to receive this degree? _____

Using the number "1" for your first choice, "2" for your second, and so on, please indicate the kind of career you would prefer:

_____ Elementary/secondary teaching
_____ Junior/community college teaching
_____ College teaching
_____ University teaching and research
_____ Federal government
_____ State/local government
_____ Private industry
_____ Other (please specify) _____

In what year do you expect to enter this career? _____

Please place AAG Specialty and Geographic Area Code Numbers from left to right in the blanks below to indicate the specialties and areas in which you are (or expect to be) most competent. (A list of these Code Numbers may be consulted in the departmental office; they are printed on page vi of the 1970 AAG *Directory*.)

_____ _____ _____ _____ _____ _____ _____ _____
Specialty Geographic Area

Listed below are the titles of courses most commonly taught in geography departments in the United States and Canada. Using the number "1" for your first choice, "2" for your second, and so forth, please indicate your areas of greatest teaching interest and preference:

_____ World regional geography
_____ Human/cultural geography
_____ Landforms/geomorphology
_____ Climatology/meteorology
_____ Quantitative techniques
_____ Historical geography
_____ Other (please specify) _____
_____ Political geography
_____ Economic geography
_____ Physical geography
_____ Biogeography/soils
_____ Urban geography
_____ Latin America
_____ North America
_____ Conservation
_____ Cartography
_____ Europe

Please check the box to indicate your sex: Male ☐ Female ☐

Name of your institution: _____

APPENDIX B

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Resource Papers

1. *Theories of Urban Location*, B.J.L. Berry, 1968
2. *Air Pollution*, R.A. Bryson, J.E. Kutzbach, 1968
3. *Perspectives on Geomorphic Processes*, G.H. Dury, 1969
4. *Spatial Diffusion*, P.R. Gould, 1969
5. *Perception of Environment*, T.F. Saarinen, 1969
6. *Social Processes in the City: Race and Urban Residential Choice*, H.M. Rose, 1969
7. *The Spatial Expression of Urban Growth*, H.M. Mayer, 1969
8. *The Political Organization of Space*, E.W. Soja, 1971
9. *An Introduction to Spatial Allocation Analysis*, A.J. Scott, 1971
10. *Man and Nature*, Yi-Fu Tuan, 1971
11. *Tropospheric Waves, Jet Streams, and United States Weather Patterns*, J.R. Harman, 1971
12. *The Spatial Structure of Administrative Systems*, B.H. Massam, 1972
13. *Residential Mobility in the City*, E.G. Moore, 1972
14. *The Periglacial Environment, Permafrost, and Man*, L.W. Price, 1972
15. *Conservation, Equilibrium, and Feedback Applied to Atmospheric and Fluvial Processes*, J.N. Rayner, 1972
16. *Metropolitan Neighborhoods: Participation and Conflict Over Change*, J. Wolpert, A. Mumphrey, J. Seley, 1972
17. *Computer Cartography*, T.K. Peucker, 1972
18. *Society, The City, and The Space-Economy of Urbanism*, D. Harvey, 1972
19. *Thematic Cartography*, P. Muehrcke, 1972
20. *Man and Environment*, K. Hewitt, F.K. Hare, 1973

Technical Papers

1. *Field Training in Geography*, K.E. Cory, A.D. Hill, J.F. Hart, N.E. Salisbury, P.F. Lewis, 1968
2. *Computer Assisted Instruction in Geography*, R.E. Huke, G.J. Fielding, K.W. Rumage, editors, 1969
3. *Evaluating Geography Courses: A Model with Illustrative Applications*, J.T. Hastings, J.L. Wardrop, D. Gooler, 1970
4. *Living Maps of the Field Plotter*, R.E. Nunley, 1971
5. *Simulation of the Urban Environment*, B.M. Kibel, 1972
6. *Computerized Instruction in Undergraduate Geography*, G.J. Fielding, K.W. Rumage, editors, 1972
7. *The Interface as a Working Environment: A Purpose for Physical Geography*, D.B. Carter, T.H. Schmudde, D.M. Sharpe, 1972
8. *LAND USE: A Computer Program for Laboratory Use in Economic Geography Courses*, D.F. Marble, B.M. Anderson, 1972
9. *A Bibliography of Statistical Applications in Geography*, B. Greer-Wootten, 1972
10. *Multidimensional Scaling: Review and Geographical Applications*, R.G. Golledge, G. Rushton, 1972

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